

## Performing STD Partner Notification via the Internet

With cases of syphilis being diagnosed in men-who-have-sex-with-men (MSM), a new strategy to increase the identification of undiagnosed infection in MSM has emerged: the notification via the Internet of sexual partners exposed to an STD, or what is now commonly referred to as "Internet partner notification" (Internet PN).

In 2003, the Division of STD Prevention organized a regional meeting to discuss rising infectious syphilis rates in New England. During this meeting, the role of the Internet became clear. Staff from the Division of STD Prevention, HIV/AIDS Bureau, and Maine STD Control, met with the owner of a popular Internet site for MSM headquartered in Cambridge, MA, to plan Internet-based STD public health interventions, including Internet PN.

The Internet provider has partnered with public health agencies to facilitate Internet PN and other traditional HIV/STD outreach through banner advertisements on the site, at no cost. In 2004 and 2005, the Division of STD Prevention performed Internet PN, authored a STD program director's guide for working online, and provided technical assistance to several other states wishing to work on the Internet. At the peak of Internet PN development, the Division of STD Prevention hosted a CDC site visit which brought together CDC management, health education researchers and management from the MSM website to discuss expansion of Internet strategies.

In August 2005, the Division of STD Prevention released an updated edition of its Internet PN policy. This policy was developed with input from communicable disease staff, focus groups of community members and consultants from management of a MSM website.

The new Internet PN policy covers notifying sexual partners of exposure to an STD and gaining written informed consent to reveal the specific nature of the STD via e-mail (for those unwilling to contact us outside the Internet), while never disclosing identifying information about the source. Because the online notification is sometimes perceived as spam mail, an additional verification step was added. The recipient can contact the website's customer service department to confirm the validity of the public health account used for partner notification.

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## Community-Associated Methicillin-Resistant *Staphylococcus aureus*

*Staphylococcus aureus* is an organism with great adaptability. Until recently, methicillin-resistance in *S. aureus* (MRSA) has been associated mostly with nosocomial (hospital-acquired) infections. Risk factors for healthcare-associated MRSA (HA-MRSA) include hospitalization, surgery, admission to a nursing home, dialysis or a permanent indwelling catheter. More recently, MRSA has been identified in individuals with no apparent risk factors and is labeled community-associated MRSA (CA-MRSA). Most CA-MRSA strains are genetically distinct from HA-MRSA strains. This article will review the microbiological and epidemiological characteristics of CA-MRSA.

As with HA-MRSA, CA-MRSA should be assumed to be resistant to all beta-lactam antibiotics (penicillins and cephalosporins). Erythromycin susceptibility in CA-MRSA strains varies from 10-100%. Although reports demonstrate CA-MRSA clindamycin susceptibility at 80-90%, these data should be viewed with caution since inducible resistance can occur with exposure to the drug. Fluoroquinolone susceptibility varies, but currently over 90% of CA-MRSA are susceptible to ciprofloxacin. Among CA-MRSA, trimethoprim-sulfamethoxazole susceptibility is high at 95%. Thus far, CA-MRSA is universally susceptible to vancomycin, daptomycin, linezolid and quinipristin-dalfopristin. (1)

Generally, CA-MRSA infections have a low mortality rate and most deaths occur in individuals with necrotizing pneumonia (1). Most infections are common skin and soft-tissue infections, but severe infections have been seen in children (2). Severe CA-MRSA pneumonia appears to be a growing problem, especially in association with influenza (3).

CA-MRSA outbreaks have been identified in particular populations: inmates in correctional facilities (4), athletes participating in team sports (5), neonates (6), military recruits (7), and Native Americans and Pacific Islanders (8,9), among others. Comparing patients with CA-MRSA to those with HA-MRSA, a study in Minnesota showed that CA-MRSA patients were more likely to be non-white, younger and have lower socioeconomic status. Among pediatric cases, many

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*The Office of Integrated Surveillance and Informatics Services (ISIS) collects public health data for the Bureau of Communicable Disease Control (BCDC). The sources of these data include hospitals, clinical laboratories, clinics, health care provider offices and local boards of health.*

In an effort to improve the timeliness and completeness of communicable disease laboratory reports, and reduce the time and cost involved in reporting of notifiable diseases, ISIS has implemented a standard method for electronic laboratory reporting (ELR). Communicable disease ELR should decrease the effort of reporting, increase efficiency of data transfer and improve the Department's ability to identify and respond, quickly and appropriately, to public health emergencies. Participating in communicable disease ELR allows laboratories to send reports for most reportable conditions through a single secure transmission method and provides an automated method to fulfill routine reporting requirements.

Communicable disease ELR should not be confused with other projects currently being deployed by the Massachusetts Department of Public Health (MDPH) including syndromic surveillance and the Bureau of Laboratory Science's (BLS) ELR System. Syndromic surveillance allows the electronic collection and analysis of chief complaint data from hospital emergency departments and other clinical sites. The BLS ELR System is a way for providers to submit test requests and receive test results from the State Laboratory Institute at MDPH. Each of these projects is independent.

Considerations in the development of communicable disease ELR infrastructure have been ease of transmission for reporting institutions, the ability to share data with public health partners, and reliable methods for tracking receipt of data and errors in file upload and transfer. From the reporter's perspective, this infrastructure functions as a tool to assist in the mapping of local codes into the standard vocabularies and file structure, as well as providing a secure method for file transmission.

An ELR pilot completed in June of 2005 was successful in improving timeliness, completeness and accuracy. Reports were received an average of two days earlier through electronic submission than through traditional methods. Throughout the pilot process, ISIS staff actively sought feedback from hospital participants regarding the ELR infrastructure and implementation process. The comments and suggestions were the basis of enhancements to all aspects of the electronic reporting process.

ISIS staff are currently working to identify hospitals and commercial laboratories that are ready to transition from paper-

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## CA-MRSA

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had an underlying dermatologic condition. The majority of adult CA-MRSA cases had an underlying medical condition (76%). (10)

In Massachusetts, we have received reports of possible CA-MRSA infection clusters in correctional facilities, among sports teams, among men who have sex with men and at colleges. Follow-up of these clusters includes enhanced surveillance, review of potential risk factors, collection of MRSA isolates for further testing at the State Laboratory Institute and intervention directed at improving hygiene practices and reducing opportunities for transmission. If you suspect you have identified a cluster of CA-MRSA infections or you have any questions about CA-MRSA, please contact the Division of Epidemiology and Immunization at (617) 983-6800.

### References

- (1) Johnson LB, Saravolatz LD. Community-acquired MRSA: current epidemiology and management issues. *Infections in Medicine* 2005; 22:16-20.
- (2) CDC. Four pediatric deaths from community-acquired methicillin-resistant *Staphylococcus aureus* - Minnesota and North Dakota, 1997-1999. *Morbidity and Mortality Weekly Report* 1999; 48(32):707-710.
- (3) Francis JS, Doherty MC, Lopatin U et al. Severe community-onset pneumonia in healthy adults caused by methicillin-resistant *Staphylococcus aureus* carrying the Panton-Valentine leukocidin genes. *Clin Infect Dis* 2005; 40(1):100-107.
- (4) Methicillin-resistant *Staphylococcus aureus* infections in correctional facilities—Georgia, California, and Texas, 2001-2003. *MMWR Morb Mortal Wkly Rep* 2003; 52(41):992-996.
- (5) Begier EM, Frenette K, Barrett NL et al. A high-morbidity outbreak of methicillin-resistant *Staphylococcus aureus* among players on a college football team, facilitated by cosmetic body shaving and turf burns. *Clin Infect Dis* 2004; 39(10):1446-1453.
- (6) CDC. Four pediatric deaths from community-acquired methicillin-resistant *Staphylococcus aureus* - Minnesota and North Dakota, 1997-1999. *Morbidity and Mortality Weekly Report* 1999; 48(32):707-710.
- (7) Campbell KM, Vaughn AF, Russell KL et al. Risk factors for community-associated methicillin-resistant *Staphylococcus aureus* infections in an outbreak of disease among military trainees in San Diego, California, in 2002. *J Clin Microbiol* 2004; 42(9):4050-4053.
- (8) Stemper ME, Shukla SK, Reed KD. Emergence and spread of community-associated methicillin-resistant *Staphylococcus aureus* in rural Wisconsin, 1989 to 1999. *J Clin Microbiol* 2004; 42(12):5673-5680.
- (9) Community-associated methicillin-resistant *Staphylococcus aureus* infections in Pacific Islanders—Hawaii, 2001-2003. *MMWR Morb Mortal Wkly Rep* 2004; 53(33):767-770.
- (10) LeDell KH, Como-Sabetti K, Lynfield R. The changing epidemiology of MRSA: emergence of community-associated MRSA in Minnesota. *Contagion* 2004; 1(2):77-84.

## Update: Avian Flu

Since December 2003, many have reported outbreaks of highly pathogenic avian influenza A (H5N1) virus affecting poultry. In SE Asia, over 150 million birds have died or been culled since 2003.

Since December 2003, over 180 H5N1 cases in humans have occurred ; with a mortality rate of about 50%.

In May of 2005, MDPH issued an alert **Avian Influenza A (H5N1) Continues in Asia: Enhanced Surveillance Needed Year Round**, with guidelines for surveillance and control of avian influenza (see [http://www.mass.gov/dph/cdc/epii/imm/alerts/avian\\_flu\\_reporting.rtf](http://www.mass.gov/dph/cdc/epii/imm/alerts/avian_flu_reporting.rtf)). An updated guideline on surveillance, testing, prevention and control of avian influenza is currently being released. Updated information on avian flu can be found at the CDC website: <http://www.cdc.gov/flu/avian/>.

*If you are interested in receiving electronic meeting announcements and minutes from the Massachusetts State/Local Pandemic Planning Committee, and other pandemic and influenza related information, contact Donna Lazorik [donna.lazorik@state.ma.us](mailto:donna.lazorik@state.ma.us).*

## The 11<sup>th</sup> Annual Adult Immunization Conference

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April 11, 2006 from 8:00 AM to 3:00 PM  
DCU Center, Worcester MA

For more information, go to [www.masspro.org](http://www.masspro.org)

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based to electronic reporting of notifiable diseases. ISIS will assist staff in determining technical readiness and will work with specialists in microbiology, infection control, information technology, and security and privacy to determine each organization's needs for information and support.

For more information contact:  
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## Nurse Highlight

This issue of communicable disease update will highlight Kathleen Coughlin, RN of the Malden Health Department.

Kathleen Coughlin (KC) has worked for the Malden Health Department since August of 2004. A 1997 graduate of Salem State College, her first nursing assignment was with Northshore Hospital as a cardiac nurse. She worked for two years as a Malden school nurse before taking the position of Public Health Nurse at the Malden Health Department. KC indicated that this job is a "one woman show". In addition to her duties as TB clinic nurse at the Malden Medical Center, she is responsible for Malden's immunization programs, vaccine management and distribution, communicable disease follow-up and surveillance, and community outreach projects.

Prior to becoming the public health nurse, KC had little experience in dealing with tuberculosis. "I learned on the job, and I had to learn very fast how to deal with tuberculosis patients, both active disease and infection." She manages the Malden TB clinic in collaboration with the Everett and Medford Health Department nurses, and outreach educators from the TB Division and the Refugee and Immigrant Health Program. "It would be impossible for me to do this job without help from the outreach educators. The language capabilities of the outreach educators and their assistance with directly observed therapy (DOT) are invaluable." KC relays that her TB patients often state how appreciative they are for having a case manager follow them and coordinate services. One of the things KC sees as being the best part of the job is that she can be with the TB patient from "start to finish". She feels having a case manager for TB patients makes a huge difference in compliance. The patients appreciate having one local person they can come to for help or with questions. KC spends a lot of time trying to get patients linked to services; many of her patients have no private medical doctor or insurance.

When not working at the Malden Health Department, KC is very family-oriented. She spends her time away from work with her family, in particular her 4-year old son. KC states the best thing about her job is that the hours allow her the best of both worlds, "I can be a nurse and I can be a mom."

The TB Division is pleased to recognize Kathleen Coughlin for her hard work and dedication to TB elimination. The Malden Health Department is fortunate to have her on their team.

## LGV in Massachusetts

In the fall of 2004, the Centers for Disease Control and Prevention (CDC) alerted clinicians to an increase in the number of cases of lymphogranuloma venereum (LGV) among men who have sex with men (MSM) in the Netherlands. Typically, fewer than 5 cases a year were reported in that country. As of September 2004, a total of 62 cases had occurred. Except for one, all patients had gastrointestinal symptoms (e.g. bloody proctitis with purulent or mucous anal discharge, tenesmus and constipation). Some patients in this LGV outbreak had reported multiple sex partners in cities in Europe and the United States. This report prompted increased awareness of this disease in the United States and enhanced surveillance.

LGV is caused by *Chlamydia trachomatis* (CT) serotypes L1, L2 and L3. Using LGV testing technology not commercially available (LGV genotyping), CDC has assisted state and local health departments across the United States in identifying patients with LGV. Confirmed cases have now been reported in cities throughout the US. The majority of patients with LGV proctitis in the U.S. have been men who have sex with men.

In Massachusetts, as of September 1, 2005, a total of 56 cases have been investigated for possible LGV because of symptoms of proctitis (36) or inguinal lymphadenopathy (10), or because they were contacts to persons suspected of having LGV (10).

Genotyping is performed at CDC on specimens testing positive for CT by standard chlamydia tests. A total of 15 investigated cases with rectal symptoms tested positive for CT. To date, eight of these samples have been sent to the CDC. Three specimens tested positive for LGV L2 and one tested positive for type G CT (not LGV). CDC was unable to sequence two samples, and two other results are pending. Five other samples will be sent to the CDC.

Genotyping, used for surveillance purposes only, confirmed the occurrence of LGV in Massachusetts. The Division of STD Prevention will continue to investigate cases and forward samples to the CDC for confirmation of LGV. It is important to note that for clinical purposes, all cases with symptoms consistent with LGV should be treated before test results are available.

### Recommended Approach

- Clinicians who care for MSM should consider LGV in the diagnosis of compatible syndromes, particularly proctitis. Other manifestations of LGV include tender lymph nodes (inguinal and/or femoral, which can become fluctuant) and anogenital ulcers (small, generally painless ulcer, usually followed by the appearance of tender lymph nodes)
- **Contact the Division of STD Prevention if you suspect a case of LGV. We can assist in direct**

### identification and serologic testing for CT in cases compatible with LGV, as well as with partner management services

- Perform direct identification testing for CT per STD Division recommendations
- Perform testing for *Neisseria gonorrhoeae* and other STDs (syphilis, HIV and HSV, as appropriate)
- Perform serologic testing for CT through the State Laboratory Institute
- Cases compatible with LGV should be treated presumptively

For more information on specimen collection/testing and for other assistance, contact Sylvie Ratelle, MD, MPH or Bill Dumas, RN, Division of STD Prevention, at (617) 983-6940.

## HIV Morbidity and Monitoring Project Update (MMP)

Massachusetts has been selected by the Centers for Disease Control and Prevention (CDC) for inclusion in the new HIV/AIDS supplemental surveillance project. It is one of 26 project sites (19 states, 6 cities, and Puerto Rico). The purpose of the MMP is to study emerging trends in the health care and health practices of HIV/AIDS patients, such as clinical characteristics, access to health care, medication adherence, harm reduction practices, and quality of life issues. Statewide and national data obtained may be obtained through the MMP to be utilized for HIV/AIDS prevention and care planning as well as for policies related to the allocation of resources. A sample of 20-40 facilities in Massachusetts providing care to HIV-positive patients will be selected by the CDC for inclusion in the MMP. These sites will be contacted by the staff of the HIV/AIDS Surveillance Program. Participation by medical facilities is voluntary. If your medical practice is contacted, we ask that you participate. For more information, see: [www.cdc.gov/hiv/projects/mmp/default.htm](http://www.cdc.gov/hiv/projects/mmp/default.htm) or contact Elizabeth Samit, MPH, Project Coordinator @ [elizabeth.samit@dph.state.ma.us](mailto:elizabeth.samit@dph.state.ma.us); Karen Wallace, MPH, Data Manager/Epidemiologist @ [Karen.Wallace@dph.state.ma.us](mailto:Karen.Wallace@dph.state.ma.us); or James Murphy, MPH, Massachusetts Principal Investigator @ [james.murphy2@dph.state.ma.us](mailto:james.murphy2@dph.state.ma.us).

### Partner Notification and the Internet continued from page one

On September 13, 2005, the CDC wrote a 'Dear Colleague' letter alerting "of the risk behaviors associated with Internet use, the intervention potential of the Internet" and "CDC encourages states to consider exploring the Internet as a potential venue for disease-control efforts." To view this letter, visit: <http://www.cdc.gov/std/DearColleague9-13-2005.pdf>.

# Refugee and Immigrant Health

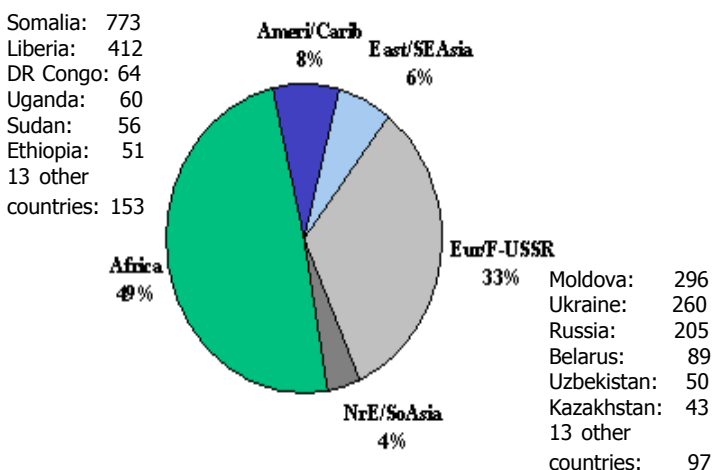
## Refugee Arrivals in Massachusetts Demographic Update: Fiscal Years 2004-2005

### Arrivals by World Region

There were 3,185 refugee arrivals in Massachusetts during July 2003 through June 2005. These include refugees, Cuban/Haitian entrants, victims of a severe form of trafficking and individuals admitted as immediate family members of persons granted asylum in the U.S.

Refugees were from 55 countries, representing all world regions; the chart shows distribution by region. Over time, the profile of refugees has shifted from a few large populations resettled over an extended period (for example, from Southeast Asia or the former Soviet Union) to more diverse populations.

Distribution of New Arrivals by Region of Origin  
N=3,185

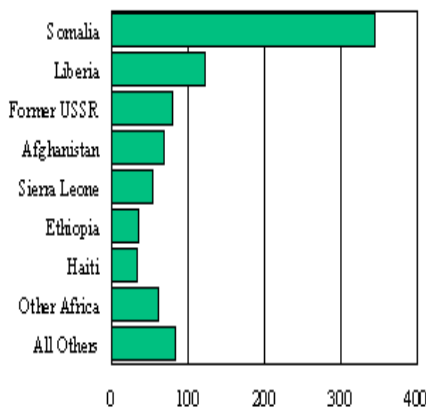


### Resettlement in Massachusetts

Refugees are resettled throughout the state. The following charts show destination, by region of the state, for the 2,993 refugees with known resettlement addresses.

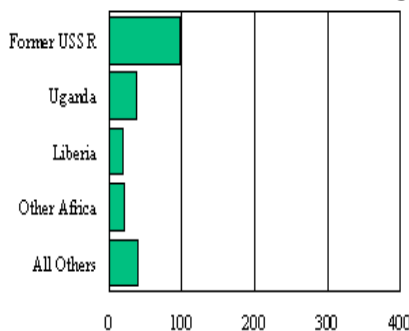
**\*Note that the scale in the charts varies.**

#### Boston Region



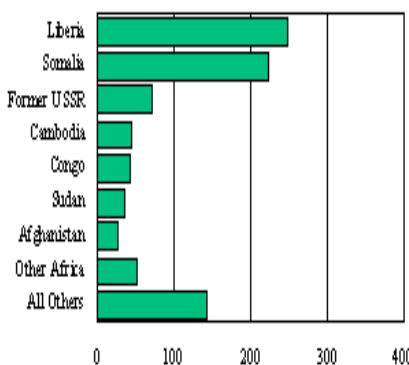
Thirty percent of new arrivals (884 persons) resettled in the Boston Region. The principal resettlement cities and towns in the region were Boston (509) and Chelsea (237). Smaller numbers resettled in Revere (44), Cambridge (41), Brookline (31) and Somerville (22). Arrivals from the former Soviet Union were from 9 countries, including Russia (37), Ukraine (12), Azerbaijan (11) and Belarus (10).

#### MetroWest and Southeast Regions



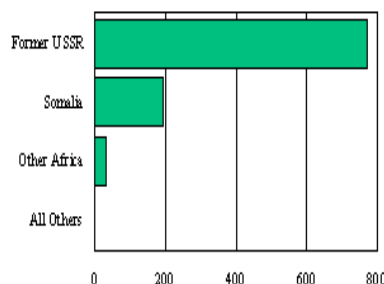
Seven percent of new arrivals (217 persons) resettled in the MetroWest and Southeast Regions. Resettlement was in Waltham (35), Framingham (16), Newton (16) and Watertown (16), with smaller numbers scattered throughout the region. The largest numbers of arrivals from the former Soviet Union were from Russia (51) and Ukraine (31).

#### Northeast and Central Regions



Thirty percent of new arrivals (888 persons) resettled in the Northeast and Central Regions. Principal resettlement cities and towns in the region were Worcester (302), Lynn (270), Lowell (74), Malden (53) and Everett (51). The largest numbers of arrivals from the former Soviet Union were from Ukraine (30) and Russia (28).

#### Western Region



Thirty-four percent of new arrivals (1,004 persons) resettled in the Western Region. The principal resettlement cities and towns were West Springfield (306), Springfield (281), Westfield (224) and Greenfield (113). Arrivals from the former Soviet Union were from Moldova (292), Ukraine (184), Russia (88), Belarus (67), Uzbekistan (47), Kazakhstan (40) and 7 other countries.

### Persons Granted Asylum in the United States

Individuals who have been granted asylum in the United States (asylees) are eligible for refugee benefits and services. The data included here are only on those asylees known to have received referral for health services; the denominator of all eligibles is not known. During the two-year period 329 asylees were identified. They were from all world regions:

Region	# Countries	# Asylees
Africa	22	165
East Asia	3	38
Europe & Central Asia	6	36
Latin America & Caribbean	6	77
Near East & South Asia	5	13
Total	42	329

# You Be the Epi

## Investigating Encephalitis

In mid-August the Virus Serology Laboratory at the State Laboratory Institute contacted the Division of Epidemiology and Immunization of the Massachusetts Department of Public Health (MDPH) to report that a human cerebrospinal fluid specimen submitted for arbovirus testing had tested positive for IgM antibodies to eastern equine encephalitis (EEE) virus. The patient lives in a county where two horses have been identified with EEE virus infection and several mosquito samples were also positive for the virus. The town where the case resides has never had a human EEE case before, but surrounding towns have had cases in the past. What actions need to be taken?

Follow-up of EEE human cases is time-sensitive since the identification of a human case is a sentinel event, with implications for immediate community risk assessment and potential mosquito control actions.

An MDPH epidemiologist will immediately retrieve case history information from the laboratory and contact the physician who ordered arbovirus testing. He/she will be asked to provide information necessary to complete an MDPH Arbovirus Case Report Form. Critical information includes:

- patient demographic information, including occupation,
- symptom description and onset date, and
- specimen collection date(s). Acute serum and cerebrospinal fluid specimens should be drawn within the first 14 days following symptom onset. Convalescent serum specimens should be obtained 10-14 days after the acute serum was collected. Most individuals will have developed an IgM antibody response detectable in serum approximately 8 days after onset and an IgG antibody response within 3 weeks.
- A complete travel history for the thirty days prior to onset, including locations and exact dates, is vital to determine a local community's risk.

Immediately upon obtaining information from the physician, the epidemiologist will relay the details to the local board of health of the town in which the case resides. They will review what educational materials are available and suggest strategies to disseminate them. People in the community must be informed of the risk and given information on how they can protect themselves.

Prevention strategies center around avoiding mosquito bites and reducing mosquito exposures:

- avoiding outdoor activities between dusk and dawn, if possible; as this is the time of greatest mosquito activity
- if outdoors, when mosquitoes are active, wearing a long-sleeved shirt and long pants
- **using a mosquito repellent when outdoors** [A variety of mosquito repellent products are available.

The most effective repellents contain DEET (N, N-diethyl-m-toluamide), picaridin (KBR 3023) or permethrin. Always follow the instructions on the product label. DEET and picaridin products can be used directly on skin and on clothing. Permethrin products can be used on clothing but not directly on skin. Oil of lemon eucalyptus has also demonstrated efficacy against mosquito bites, with protection similar to repellents with low concentrations of DEET. Products containing DEET should not be used on children less than 2 months of age and should be used in concentrations of 30% or lower for older children and adults. The following additional precautions should be observed when using DEET products:

- ⇒ Avoid using DEET products that combine the repellent with a sunscreen. Sunscreens may need to be reapplied too often, resulting in an over application of DEET
- ⇒ Apply DEET on exposed skin, using only as much as needed
- ⇒ Do not use DEET on the hands of young children and avoid applying repellent to areas around the eyes and mouth
- ⇒ Do not use DEET over cuts, wounds or irritated skin
- ⇒ Wash treated skin with soap and water after returning indoors and wash treated clothing
- ⇒ Avoid spraying DEET products in enclosed areas.]
- fixing damaged screens and ensuring they are tightly attached to doors and windows
- reducing mosquito populations by getting rid of standing water around the home that is available for mosquito breeding [Mosquitoes will begin to breed in any puddle or standing water that lasts for more than four days. Water may collect, for example, in recycling containers, ceramic pots, plastic wading pools, old tires or clogged gutters.]

The epidemiologist may email or fax a sample press release for local board of health use. [Depending on the situation, MDPH may issue a statewide press release.] The local board of health may post information on the city or town's official website.

The epidemiologist will suggest that the local board of health contact their mosquito control district to discuss vector control strategies. The range of available options are outlined in the Massachusetts Arbovirus Surveillance and Response Plan which is available on the MDPH website at: [www.mass.gov/dph/wnv/arbovirus\\_surveillance\\_plan\\_2005.pdf](http://www.mass.gov/dph/wnv/arbovirus_surveillance_plan_2005.pdf). If the city or town is not currently participating in a mosquito control district and would like more information, they will be directed to the Department of Agricultural Resources, State Reclamation and Mosquito Control Board at 617-626-1700.

Once both the case's physician and local board of health have  
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## What Factors Influence Treatment Completion in Persons with Tuberculosis: A Retrospective Study of Massachusetts Cases, 1999 – 2001

The incidence of tuberculosis (TB) in the United States remains five times higher than the Healthy People 2010 target of less than one new case per 100,000 population, with treatment completion rates 10% below the national objective of 90%. Incomplete therapy results in drug resistance and continued transmission. The highest priority for TB programs is to ensure that persons with TB disease complete curative therapy.

National guidelines recommend directly observed therapy (DOT) as the standard of care to ensure treatment completion; however, there is insufficient evidence to support it as a universal intervention. The majority of studies identify DOT as the major variable responsible for differences in completion rates, with limited attention given to competing explanatory variables, which ultimately may be responsible for treatment outcomes independent of DOT.

A research study was conducted to identify variables that influence treatment completion with different in treatment approach (self administered therapy [SAT] vs. DOT). This study was a retrospective cohort analysis of 591 TB cases who started on treatment in Massachusetts from 1999 through 2001. Those factors associated with treatment completion were evaluated using data extracted from national surveillance and Massachusetts' patient management system databases. Survival analysis (Cox proportional hazard regression) methods were used. Individual patient attributes (e.g., socio-demographics, and social and behavioral indicators for potential nonadherence), clinical factors (e.g. treatment and clinical characteristics, including pulmonary findings, bacteriology indicators, adverse reactions, HIV status, and TB/HIV drug interactions), and care system characteristics (e.g., health care and nursing case management, including the use of incentives/enablers, nursing consultation, outreach, and long-term care hospitalization for TB) that could potentially influence treatment completion were examined for their relationship to treatment completion. To prevent bias arising from different treatment regimens that require different lengths of therapy, data were stratified by the expected length of therapy.

The results demonstrated that there were no overall differences in treatment completion among patients managed by SAT, DOT, or a combination. Demographic variables were unreliable predictors of treatment completion. Clinical variables associated with longer therapy included abnormal chest radiograph, drug resistance (especially multi-drug resistance) and adverse reactions. Cases with factors listed were less likely to complete treatment in a timely fashion. A surprising finding was that fifteen percent of all cases had drug reactions need-

ing permanent medication change, which impacts the ability to meet the national program objective for treatment completion. Outreach intervention, incentives, nursing consultation regarding inappropriate treatment, long-term care TB hospitalization, and treatment approach had no independent effect on completion.

Findings suggest good outcomes can be achieved with different strategies, supporting the premise that a multifaceted approach is needed for TB control and no one strategy, including DOT, will work in all situations. The results of this study underscore the importance of nursing case management and patient-centered care in assisting patients with TB disease to complete treatment. Although individually, interventions may impact outcome, as part of a total patient package (patient-centered care), no one strategy stands out. The results suggest that the combined efforts of local board of health nurses and the TB Division nursing case management system work effectively to control TB, and that good nursing assessment of risk factors for nonadherence and ongoing case management can determine appropriate strategies and treatment approach for each patient. However, even with a strong TB program, some individual patients with indicators of potential nonadherence did not receive DOT or other relevant interventions.

Conclusions support the need to provide patient-centered care with selective DOT (based on an assessment of individual attributes) and maintain public health infrastructure. Additional research is also needed to further quantify the effectiveness of interventions.

**COMMUNICABLE DISEASE UPDATE** is a quarterly publication of the Bureau of Communicable Disease Control, Massachusetts Department of Public Health.

Current and past issues of CD Update are available online at:  
<http://www.mass.gov/dph/cdc/update/comnews.htm>

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### ***You Be the Epi*** ***continued from page 7***

been contacted, information on the case will be posted on the MDPH arbovirus website: [www.mass.gov/dph/wmv/wmv1.htm](http://www.mass.gov/dph/wmv/wmv1.htm). This website contains educational materials for the general public, health care providers, local public health agencies and veterinarians. During the mosquito season, surveillance information on birds, mosquitoes, horses and humans is updated on a daily basis.